#4434

SITE ASSESSMENT WORK PLAN
605 E. Maple
Maquoketa, Iowa

Project No. 01052020
March 22, 2006

Prepared For:
City of Maquoketa
Maquoketa, Iowa

Prepared By:

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ASSESSMENT WORK PLAN
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1.0 INTRODUCTION

The objectives of the site assessment work plan are to: 1) identify the types and sources of contamination; 2) define the extent and magnitude of contamination in both soil and ground water; 3) identify impacts relating to the contamination; and, 4) provide adequate information for assessing potential threats to human health or the environment. The work plan is a flexible document that describes how the assessment will be conducted. The work plan is prepared for submittal to the IDNR consistent with the Land Recycling Program and Response Action Standards under Iowa Administrative Code 137.

2.0 SCOPE OF WORK

The intent of the Site Assessment Work Plan is to provide information to determine the extent reasonable and necessary for mitigation of site contaminants and address potential concerns identified by the IDNR correspondence March 23 and May 31, 2005. A summary of these concerns was based on the Phase I / II Environmental Site Assessment Report prepared by Missman Stanley & Associates on October 15, 1999. These included:

- Chlorinated solvents near sample location B-3;
- Possible saturation of soil and groundwater as toluene and other volatile compound near sample location B-6.

3.0 SITE DESCRIPTION

The subject property measures approximately twelve (12) acres in size and was located within the southeast quarter of the southwest quarter (¼) of Section 19, Township 84 North, Range 3 East, at 605 E. Maple Street in Maquoketa, Iowa. The property's location is depicted in Figure 1 (Appendix A) which is a portion of the U.S. Geological Survey (USGS) 7.5 minute series topographical map containing the site and surrounding area. A zoning map for the City of Maquoketa is provided in Appendix A, Figure 2. The subject and surrounding properties are to the north are zoned industrial, immediately west and southwest are residential. The land to the south is agricultural. Details of individual property owners and land use are identified on the Site Vicinity Map within a 500-foot radius of the facility (Figure 3).

4.0 BACKGROUND

According to the Phase I / II Environmental Report prepared by Missman Stanley in 1999, Clinton Engines took possession of the property in approximately 1950 from the Maquoketa Company. Prior to operation by the Maquoketa Company the land was used for agricultural purposes.

The Company built the widely-known "Clinton Engine" which was a small engine used in generators, mowers, chainsaws, and a host of other products. The Company experienced its "hay day" in the 1950s through the mid-1960s and employed up to 2200 people. The facility included a foundry, machine shops, cast and painting operations. At the time of the assessment the property included three paint booths. Underground storage of fuel oil was used for a back up to the boiler and generator systems. Previously underground storage included toluene and gasoline.

The Phase II Assessment identified two source areas remaining on the property. This included elevated concentrations of chlorinated solvents near B-3 located north of the former foundry operations and elevated concentrations of toluene above groundwater saturation at location B-6 adjacent to the former underground storage tanks north of the machine shop.

5.0 SITE GEOLOGY

Site geology was interpreted from soil bore logs previously conducted at the facility and the Iowa Geological GEOSAM database. The subject property was underlain by approximately one (1) to twelve (12) feet of fill material according to the soil boring logs. Immediately below the fill material, brown silty clay was encountered to a depth of approximately 10-15 feet below grade. Below the silty clay to a depth of approximately 30 feet (Tier 1 FRC Report), alternating silty clay and sand layers were encountered. Generally groundwater was encountered within 15 feet below grade. Hydraulic conductivity was formerly evaluated as part of a Leaking Underground Storage Tank program. Hydraulic conductivity ranged from 0.002 m/day to a maximum value of 0.247 m/day along the southern property boundary. The monitoring wells near the southwest side of the property were destroyed during demolition activities. However, three of the original monitoring wells for the LUST assessment exist on the south central portion of the property, where the maximum conductivity was encountered. Bedrock was not encountered at soil boring termination of approximately thirty (30) feet below grade.

Depth to bedrock estimation is taken from the GEOSAM database water well 24834 City of Maquoketa Water Well, depth to bedrock was encountered at approximately 125 feet below grade; however the elevation of the water well is approximately 45 feet higher than the average site topography. The well is located approximately two thousand (2,000) feet to the southeast. Depth to bedrock at the site would be anticipated approximately 160 feet below grade.

6.0 POTENTIAL RECEPTOR SURVEY

The Iowa Geological Survey Bureau (IGSB) and City of Maquoketa Municipal Water Supply were contacted to identify potential groundwater receptors within a one-half mile radius of the facility. The IGSB search did not identify any wells within the search radius. As part of the Tier 1 Report (July 2004), neighboring properties within three hundred (300) feet were also contacted for potential water wells, no wells were identified.

According to the IGSB, the closest well appears to be well number 24834 (3/9/2006). The well was drilled for the City of Maquoketa in 1978 and is recorded with a total depth of 2,325 feet. The well is approximately 2,000 feet southeast of the property.

7.0 REMEDIAL OBJECTIVES

Remedial objectives for the release of petroleum and chlorinated solvent compounds are based on "Table 1. Standard for Groundwater, Iowa Land Recycling Program (October 4, 1999) and Table 2. Standards for Soil, Iowa Land Recycling Program (October 4, 1999)". A copy of the remedial objectives is presented in Appendix B.

8.0 PROPOSED SOIL BORING / MONITORING WELL LOCATIONS

The assessment work plan consists of characterizing contamination at the site through soil and ground water sampling. Soil samples will be collected from potential source areas and monitor potential receptors. Based on previous sampling data, and potential concerns raised by the IDNR include:

1. The presence of chlorinated solvents near B-3; and
2. The area near the former paint thinner (toluene) underground storage tank (B-6).

Please refer to Proposed Sample Location Diagram, Figure 3, Appendix A.

8.1 B-3 Chlorinated Solvent:

Previously, impact to soil and groundwater was detected north of a former concrete pad located on the northeast central part of the property. The Phase I/II did not detail the former use of the pad or indicate a possible origin of the chlorinated solvent detection.

Soil borings B-3 was identified as a potential source area for the chlorinated solvents, a second soil boring (B-4) was advanced to the southwest (topographically upgradient of B-3). Soil samples were collected to three (3) feet in B-4 and four (4) feet in B-3. Increasing PID readings were reported at depth. Groundwater was encountered in B-3 at a depth of approximately twelve (12) feet below grade.

Due to the limited soil sampling in the potential source areas, a source monitoring well is proposed near B-3, three additional monitoring wells are proposed to bracket the source soil and groundwater conditions. Anticipated depth of well completion would be approximately twenty (20) feet below grade.

8.2 B-6 Toluene

Soil boring B-6 / temporary monitoring well were advanced adjacent to the former paint thinner underground storage tank. Saturated conditions were encountered in the groundwater concentration for toluene. A source monitoring well and three bracketing wells are proposed in the area.

9.0 INTRUSIVE METHODOLOGIES

9.1 Soil Sampling

Discrete soil samples will be collected with a direct push dual tube sampling system. The dual-tube system includes an interior two (2) inch diameter and 2.75 inch exterior diameter sampling system. Soil samples are collected in a 2 inch diameter by four (4) foot clear PVC disposable liner.

9.2 Soil Sampling – Proposed Monitoring Wells (PMW-10 – PMW-17)

The borings proposed for conversion to monitoring wells will be completed using a direct push truck-mounted rig equipped with a hydraulic head employed in drilling and sampling operations. The borings will be advanced using 2.75 inch outside diameter dual tube samplers to a depth of approximately twenty (20) feet below grade. The wells will be constructed with schedule 40 PVC 0.01 slotted well screen and pvc casing to ground surface. The groundwater elevation observed during drilling will be split between the screened interval to monitor for groundwater fluctuation.

Soil Boring Logs

The FRC field crew will consist of an experienced driller and an Iowa CGWP. The drill crew will prepare field logs of each boring. These logs will include visual classifications of the materials encountered during drilling as well as the driller's interpretation of the subsurface conditions between samples. Boring logs will be included with the Site Assessment Report and will represent an interpretation of the field logs and may include modifications based on laboratory observation and/or tests of the samples.

Soil Sample Screening

Soil samples collected will be evaluated for the presence of organic vapors using a photoionization detector (PID). This machine provides direct reading in parts per million isobutylene equivalents (ppmi); generally a 1:1 response relative to benzene by ionizing volatile organic compounds released into sample headspace from soil samples. A Ziploc bag containing a split of the soil sample on one (1) foot increments will be allowed to rise to ambient conditions during a thirty to sixty minute period. A photoionization detector calibrated to one hundred parts per million isobutylene is proposed for the field survey. The PID is equipped with a 10.6 eV ultraviolet lamp source.

The PID is not compound-specific but measures the total response of all volatile compounds in the sample that can be ionized by the detectors and are present in sufficient concentrations to be detected by the detector. The PID unit is not quantitative but will be used for sample screening and soil sample selection for laboratory analysis.

Where PID readings are detected one soil sample will be submitted from the highest PID reading and a second soil sample will be collected from the soil sample collected near boring termination when PID readings diminish to 10 ppmi or less to delineate the vertical profile. If PID readings are not detected in the soil boring above 10 ppmi a soil sample will be submitted from the groundwater interface observed while drilling.

Soil Sampling for Analytical Characterization

Soil samples from each depth interval will be laboratory packed for possible analysis. Select soil samples will be submitted to Test America, Inc. in Cedar Falls Iowa. The soil sample exhibiting the highest PID value will be field preserved by Method 5035 and analyzed for volatile organic hydrocarbons by 8260. Additional soil samples representing a vertical profile will be collected near soil boring termination when PID values decrease to 10 ppmi or less.

Physical Testing

This information will be used when considering the feasibility of remedial alternatives. The following number and types of testing will be conducted. Physical soil testing will be conducted, at minimum, on the fill material and glacial till as described from previous assessment activities.

- One (1) organic content analyses by thermal destruction to address contaminant degradation potential will be collected in the fill material and one from the soil immediately below the fill.
- One (1) water content analyses by dry weight in the fill material and one from the soil immediately below the fill.
- One (1) vertical permeability test in the fill material and one from the soil immediately below the fill.
- One (1) redox potential test in the fill material and one from the soil immediately below the fill.

Cleaning Procedures

Drilling equipment will be cleaned prior to and at the completion of each boring with high pressure water (HPW) and Alconox detergent. In addition, downhole drilling equipment will be rinsed with ethyl alcohol. These cleaning procedures are proposed based on the understanding that levels of effort required exceed normal care but do not absolutely preclude cross-sample interference.

9.3 Aquifer Characterization

Monitoring Well Construction

Monitoring well materials will consist of 0.75 to 1.25 inch nominal diameter PVC screen and casing. The wells will be constructed of schedule 40 PVC flush threaded pipe with ten (10) feet of commercially-slotted screen at the bottom of each borehole.

The monitoring screen slot size will be 0.01 inch. A matching nominal diameter solid stem riser pipe will be attached to the screen and extend to ground surface. The borehole annulus will be filled with graded well pack to a point at least one (1) foot above the top of the slotted well screen. A bentonite pellet seal will be installed and hydrated with potable water above the well pack. The annulus above the bentonite plug will be filled with a cement and bentonite grout mixture. Each well will be fitted with an expandable locking cap installed on the top opening of the riser pipe to inhibit well impact from surficial sources. Flush mount protective covers will also be used to secure wells where above-ground security devices inhibit traffic (refer to cross-sectional monitoring well diagram Figure 4, Appendix A).

Surveying

Elevations will be measured to an accuracy of ±0.01 foot. Information should only be considered accurate to the degree implied by these methods.

Monitoring Well Development

The monitoring wells will be developed by FRC personnel. A low flow peristaltic pump will be used to remove approximately three (3) well volumes. Monitoring wells will be considered developed when the pH, temperature, and conductivity of the purge water appears to have stabilized within the following tolerances:

- pH plus or minus 0.5 unit;
- temperature +/- two degrees Celsius; and
- specific conductance +/- five percent.

9.4 Groundwater Sampling Protocol

Sampling Procedures

Field instruments will be field calibrated before collecting samples. Water levels will be measured to the nearest 0.01 foot from the surveyed reference point before removing any ground water from the well. The water level is an ORS interface probe capable of differentiating phase-separated liquid at air-water and well termination. Groundwater samples will be obtained by inserting a disposable silicon and tygon tubing down the well casing and connected to a low-flow peristaltic pump.

Well construction and development can significantly affect many water quality parameters including those monitored during well purging. FRC recommends waiting at least one week after development before collecting the first samples.

Laboratory Sample Collection:

The labels on the soil and water sample bottles will indicate:
Type of analysis;

Name of facility;
Sample point identification;
Name of person collecting the sample;
Time and date the sample was collected; and,
Whether a preservative was added to the sample or the sample was filtered.

Collecting the Water Samples:

Hydrochloric persevered 40 ml vials will be used to preserve and transport the groundwater samples to the laboratory. Keeping these bottles free of extraneous contamination is imperative. Care will be taken to minimize ground contact. Plastic sheeting, where necessary, will be set around the well casings to minimize sample interference.

Chain of Custody:

"Chain-of-custody" tracking will be required on all samples. "Chain-of-custody" provides a record of all the personnel responsible for handling the samples.

Transportation

Samples and field/trip blanks will be stored at four (4) degrees Celsius until analyzed. Freezer packs are preferable to ice for short time periods. If ice is used, ziploc type bags will be used to contain ice and melt water.

10.0 HEALTH AND SAFETY

The site assessment work plan assumes that no greater than Level D safety precautions are adequate. Level D safety attire generally consists of a normal work uniform including rubber gloves, steel toed boots, hardhat, and appropriate eye protection. A health and safety plan will be developed prior to mobilization.

11.0 EXPANDED DATA / RECORDS ACCUMULATION

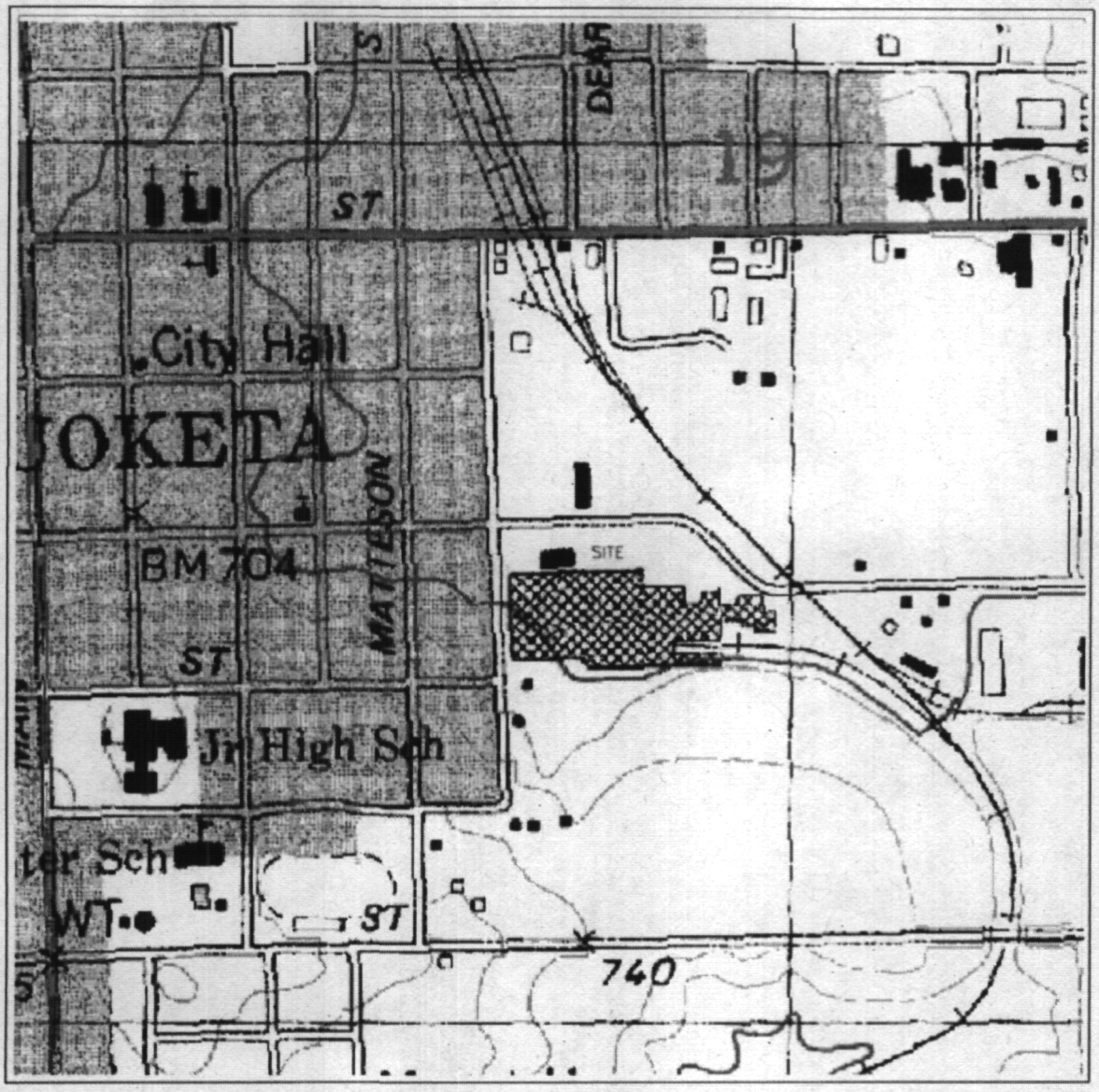
SAP implementation will attempt to accumulate additional information relative to regional and site specific conditions, which may influence the extent and need for corrective action relative to this site.

12.0 WORK SCHEDULE

Following review and acceptance of the work plan, the intrusive assessment and an initial groundwater sampling event will be conducted within thirty (30) days from authorization. A report of the will be prepared within thirty (30) days following receipt of soil and groundwater analysis. If additional sampling is required to define the lateral extent of the impact to soil and groundwater the IDNR and City of Maquoketa will be contacted and a revision to the SAP will be submitted within 15 days of receipt of analytical results.

APPENDIX A

Topographic Map
Site Vicinity Map
Site Diagram with Proposed Sampling Locations
Well Construction Diagram



1 0 5 0 KILOMETERS 1 2

1000 0 METERS 1000 2000

1 0 5 0 1

MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10 000

FEET

DOTTED LINES REPRESENT 5-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

N

FOREST ROAD CONSULTING
DAVENPORT, IOWA

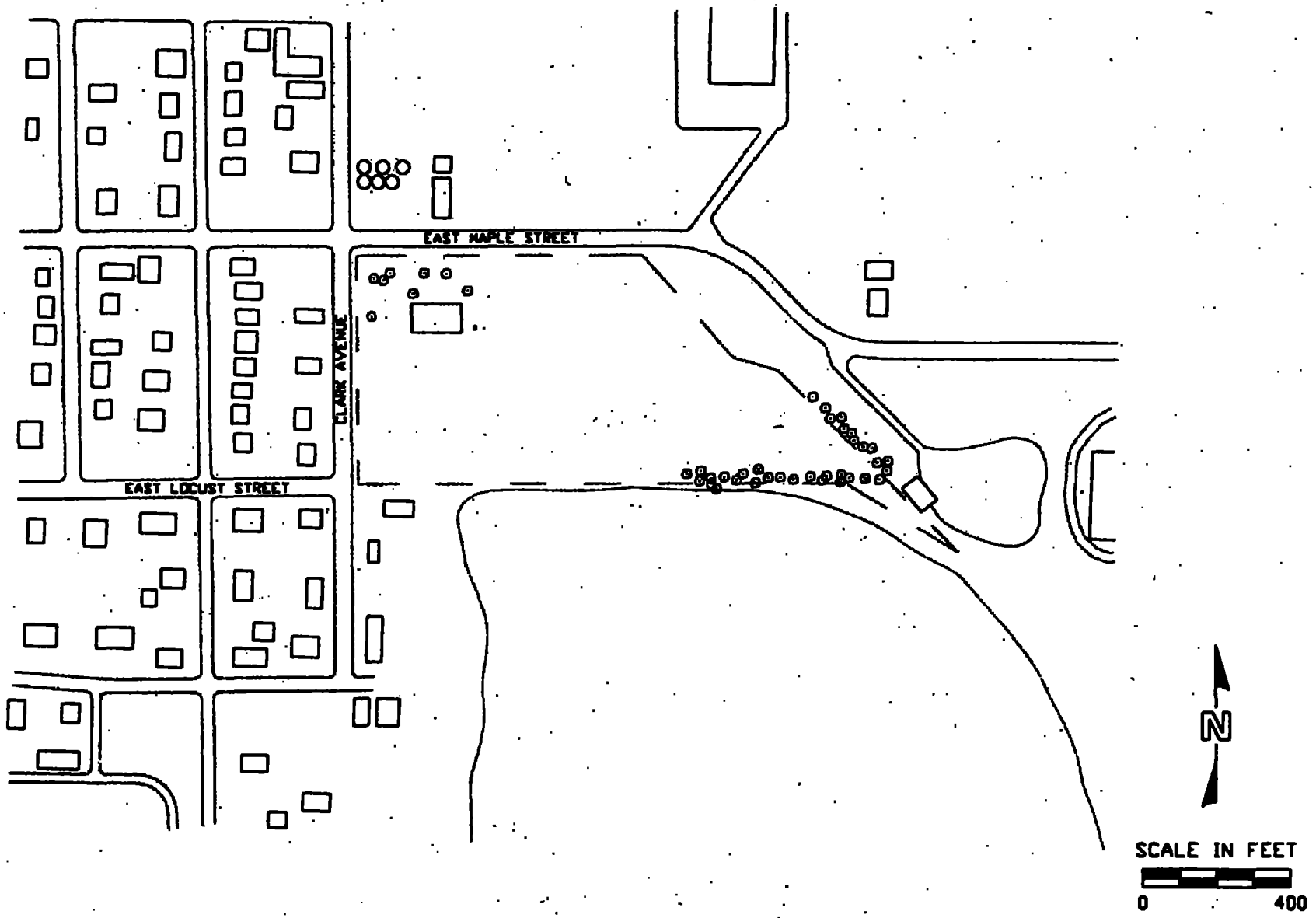
RJO DRAWN BY: MPP

FORMER CLINTON ENGINES
605 E. MAPLE STREET
MAQUOKETA, IOWA

TOPOGRAPHIC SITE MAP

SCALE: AS SHOWN

DATE: PRE 2004 IGSB



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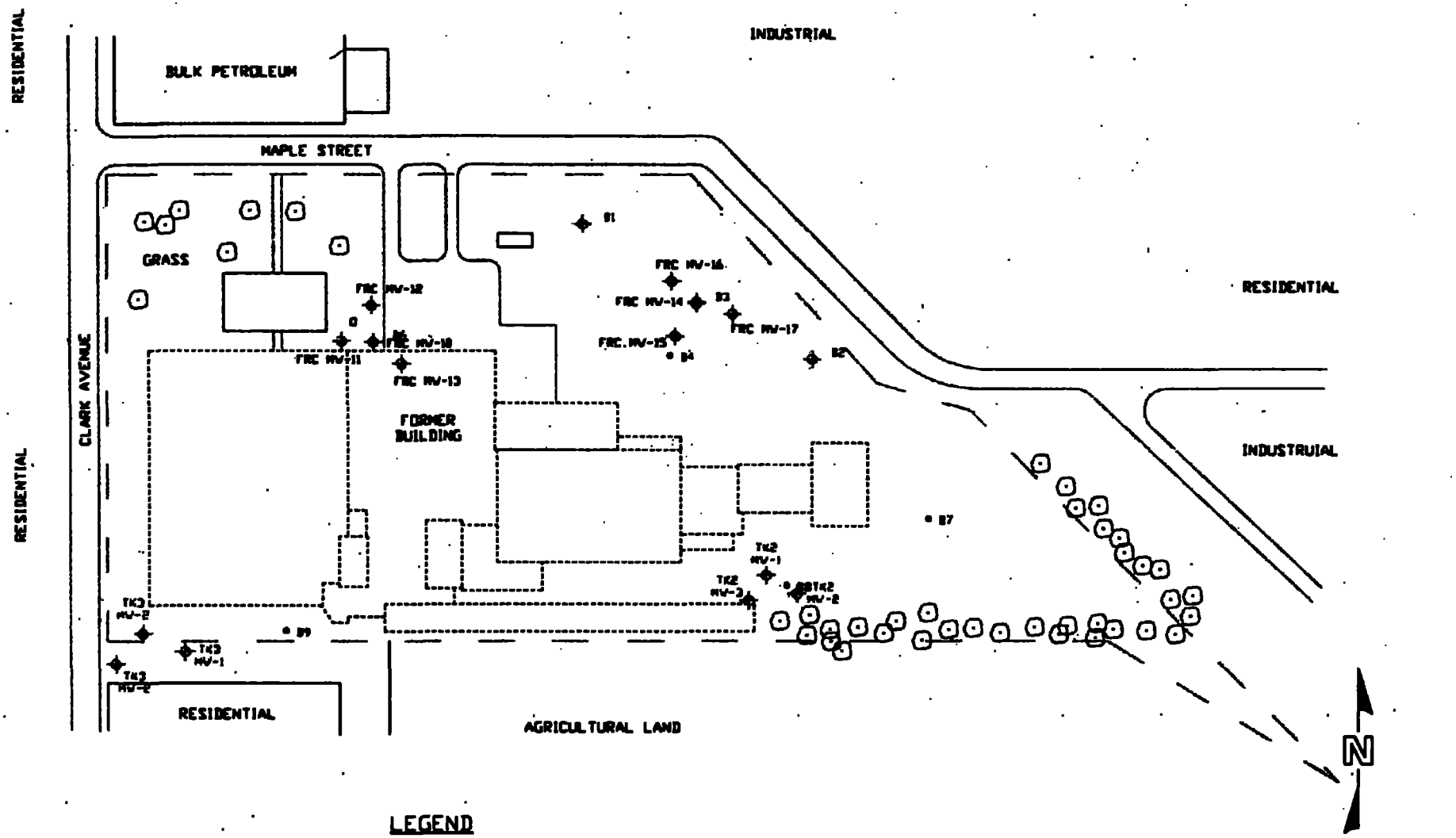
FORMER CLINTON ENGINES 605 EAST MAPLE STREET MAQUOKETA, IOWA	SITE VICINOTY MAP
	SCALE: AS SHOWN DATE: 3/21/06

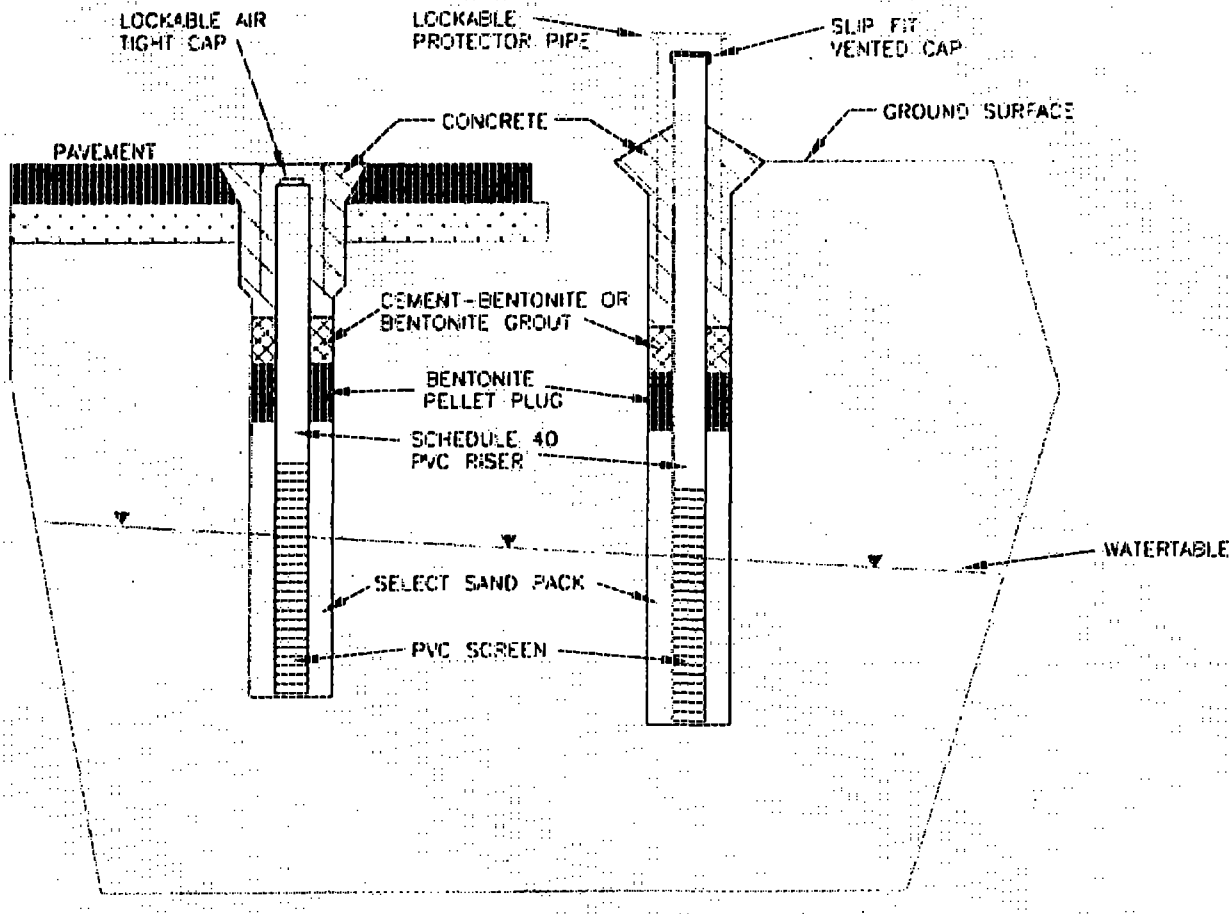


Forest Road Consulting, Inc.

FORMER CLINTON ENGINES 605 EAST MAPLE STREET MAQUOKETA, IOWA	SITE MAP
	SCALE: AS SHOWN DATE: 3/21/06

FLUSH MOUNTED MONITORING WELL

STANDARD ABOVE GROUND PROTECTED MONITORING WELL



TYPICAL CONSTRUCTION DETAILS
FOR FLUSH AND ABOVE GROUND
MONITORING WELLS

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APPENDIX B

Remedial Objectives

Table 2. Standards for Soil, Iowa Land Recycling Program

(Current as of October 4, 1999)

Chemical	CASRN	Oral Chronic RfD (mg/kg-day)	Oral Slope Factor $(mg/kg\text{-}day)^{-1}$	Cancer Group	Statewide Standard for Soil (mg/kg)
Acenaphthene	000083-32-9	6.00E-02[a]		D[d]	4,700
Acetochlor	034256-82-1	2.00E-02[a]		D[d]	1,600
Acetone	000067-64-1	1.00E-01[a]		D[a]	7,800
Acrylamide	000079-06-1	2.00E-04[a]	4.50E+00[a]	B2[a]	0.47
Acrylonitrile	000107-13-1	1.00E-03[b]	5.40E-01[a]	B1[a]	3.9
Alachlor	015972-60-8	1.00E-02[a]	8.00E-02[b]	B2[b]	27
Aldicarb	000116-06-3	1.00E-03[a]		D[a]	78
Aldicarb Sulfone	001646-88-4	1.00E-03[a]		D[c]	78
Aldicarb Sulfoxide	001646-87-3	1.00E-03[c]		D[c]	78
Aldrin	000309-00-2	3.00E-05[a]	1.70E+01[a]	B2[a]	0.15
Ametryn	000834-12-8	9.00E-03[a]		D[c]	700
Ammonium Sulfamate	007773-06-0	2.00E-01[a]		D[c]	16,000
Anthracene	000120-12-7	3.00E-01[a]		D[a]	23,000
Antimony	007440-36-0	4.00E-04[a]		D[c]	31
Arsenic, Inorganic	007440-38-2	3.00E-04[a]	1.50E+00[a]	A[a]	12
Atrazine	001912-24-9	3.50E-02[a]	2.22E-01[b]	C[b]	2,700
Barium (and compounds)	007440-39-3	7.00E-02[a]		D[a]	5,500
Baygon	000114-26-1	4.00E-03[a]		C[c]	310
Bentazon	025057-89-0	3.00E-02[a]		E[a]	2,300
Benz[a]anthracene	000056-55-3		7.30E-01[c]	B2[a]	2.9
Benzene	000071-43-2		2.90E-02[a]	A[a]	73
Benzo[a]pyrene	000050-32-8		7.30E+00[a]	B2[a]	0.29
Benzo[b]fluoranthene	000205-99-2		7.30E-01[c]	B2[a]	2.9
Benzo[k]fluoranthene	000207-08-9		7.30E-02[c]	B2[a]	29
Beryllium	007440-41-7	2.00E-03[a]	4.40E+00[c 2)]	B1[a]	0.48[b]
Bis(2-chloroethyl)ether	000111-44-4		1.10E+00[a]	B2[a]	1.9

NOTE: Soil standards are based on incidental ingestion of soil and dust only. Compliance with soil standards does not guarantee compliance with standards in other media (e.g., groundwater) that may be affected by contaminants in soil. Use of site-specific soil standards must be supported by appropriate institutional controls, i.e., land-use restrictions.

Table 2. Standards for Soil, Iowa Land Recycling Program

(Current as of October 4, 1999)

Chemical	CASRN	Oral Chronic RfD (mg/kg-day)	Oral Slope Factor $(mg/kg\text{-}day)^{-1}$	Cancer Group	Statewide Standard for Soil (mg/kg)
Bis(2-chloroisopropyl)ether	000108-60-1	4.00E-02[a]		D[c]	2,400
Bis(2-ethylhexyl)phthalate	000117-81-7	2.00E-02[a]	1.40E-02[a]	B2[a]	150
Boron (and Borates)	007440-42-8	9.00E-02[a]		D[c]	7,000
Bromacil	000314-40-9	1.30E-01[c]		C[c]	10,000
Bromochloromethane	000074-97-5	1.30E-02[c]		D[a]	1,000
Bromodichloromethane	000075-27-4	2.00E-02[a]	6.20E-02[a]	B2[a]	34
Bromoform	000075-25-2	2.00E-02[a]	7.90E-03[a]	B2[a]	270
Bromomethane	000074-83-9	1.40E-03[a]		D[a]	110
Bromoxynil	001689-84-5	2.00E-02[a]		D[d]	1,600
Butyl Benzyl Phthlate	000085-68-7	2.00E-01[a]		C[a]	16,000
Butylate	002008-41-5	5.00E-02[a]		D[c]	3,900
Cadmium	007440-43-9	5.00E-04[a]		B1[a]	39
Carbaryl	000063-25-2	1.00E-01[a]		D[c]	7,800
Carbazole	000086-74-8		2.00E-02[b]	B2[b]	110
Carbofuran	001563-66-2	5.00E-03[a]		E[c]	390
Carbon Disulfide	000075-15-0	1.00E-01[a]		D[d]	7,800
Carbon Tetrachloride	000056-23-5	7.00E-04[a]	1.30E-01[a]	B2[a]	16
Carboxin	005234-68-4	1.00E-01[a]		D[c]	7,800
Chloral Hydrate	000302-17-0	2.00E-04[c]		C[c]	16
Chloramben	000133-90-4	1.50E-02[a]		D[c]	1,200
Chlordane (also CASRN 12789-03-6)	000057-74-9	5.00E-04[a]	3.50E-01[a]	B2[a]	36
Chlorimuron, Ethyl-	090982-32-4	2.00E-02[a]		D[d]	1,600
Chlorine	007782-50-5	1.00E-01[a]		D[c]	7,800
Chlorine Cyanide	000506-77-4	5.00E-02[a]		D[d]	3,900
Chlorine Dioxide	010049-04-4	1.00E-02[c]		D[a]	780
Chlorite (sodium salt)	007758-19-2	3.00E-03[c]		D[a]	230

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Chemical	CASRN	Oral Chronic RfD (mg/kg-day)	Oral Slope Factor $(mg/kg\text{-}day)^{-1}$	Cancer Group	Statewide Standard for Soil (mg/kg)
Chloroaniline, p-	000106-47-8	4.00E-03[a]		D[d]	[redacted]
Chlorobenzene [Monochlorobenzene]	000108-90-7	2.00E-02[a]		D[a]	[redacted]
Chlorodibromoethane [Dibromochloroethane]	073506-94-2	2.00E-02[c]		C[c]	[redacted]
Chloroform	000067-66-3	1.00E-02[a]	6.10E-03[a]	B2[a]	[redacted]
Chloromethane	000074-87-3	4.00E-03[c]	1.3E-02[b]	C[b]	[redacted]
Chloronaphthalene, Beta-	000091-58-7	8.00E-02[a]		D[d]	[redacted]
Chlorophenol, 2-	000095-57-8	5.00E-03[a]		D[c]	[redacted]
Chlorothalonil	001897-45-6	1.50E-02[a]	1.10E-02[b]	B2[b]	[redacted]
Chlorotoluene, o- [2-Chlorotoluene]	000095-49-8	2.00E-02[a]		D[c]	[redacted]
Chlorotoluene, p- [4-Chlorotoluene]	000106-43-4	2.00E-02[c]		D[c]	[redacted]
Chlorpyrifos	002921-88-2	3.00E-03[a]		D[c]	[redacted]
Chromium III	016065-83-1	1.50E+00[a]		D[a]	[redacted]
Chromium VI	018540-29-9	3.00E-03[a]		D[a 4)]	[redacted]
Chrysene	000218-01-9		7.30E-03[c]	B2[a]	[redacted]
Copper	007440-50-8	3.70E-02[b 3)]		D[a]	[redacted]
Cumene [Isopropylbenzene]	000098-82-8	1.00E-01[a]		D[a]	[redacted]
Cyanazine	021725-46-2	2.00E-03[b]	8.40E-01[b]	C[b]	[redacted]
Cyanide (CN^-)	000057-12-5	2.00E-02[a]		D[a]	[redacted]
Dacthal	001861-32-1	1.00E-02[a]		D[c]	[redacted]
Dalapon, sodium salt	000075-99-0	3.00E-02[a]		D[c]	[redacted]
Di(2-ethylhexyl)adipate	000103-23-1	6.00E-01[a]	1.20E-03[a]	C[a]	[redacted]
Diazinon	000333-41-5	9.00E-04[b]		E[c]	[redacted]
Dibenz[a,h]anthracene	000053-70-3		7.30E+00[c]	B2[a]	[redacted]
Dibromoacetonitrile	003252-43-5	2.00E-02[c]		C[c]	[redacted]
Dibromochloromethane	000124-48-1	2.00E-02[a]	8.40E-02[a]	C[a]	[redacted]
Dibromo-3-chloropropane, 1,2- [DBCP]	000096-12-8		1.4E+00[b]	B2[b]	[redacted]

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Table 2. Standards for Soil, Iowa Land Recycling Program

(Current as of October 4, 1999)

Chemical	CASRN	Oral Chronic RfD (mg/kg-day)	Oral Slope Factor $(mg/kg\text{-}day)^{-1}$	Cancer Group	Statewide Standard for Soil (mg/kg)
Dibromoethane, 1,2- [Ethylene Dibromide]	000106-93-4		8.50E+01[a]	B2[a]	0.025
Dibromomethane [Methylene Bromide]	000074-95-3	1.00E-02[b]		D[d]	780
Dibutyl Phthalate	000084-74-2	1.00E-01[a]		D[d]	78000
Dicamba	001918-00-9	3.00E-02[a]		D[c]	2300
Dichloroacetonitrile	003018-12-0	8.00E-03[c]		C[c]	630
Dichlorobenzene, 1,2- [o-Dichlorobenzene]	000095-50-1	9.00E-02[a]		D[d]	7000
Dichlorobenzene, 1,3- [m-Dichlorobenzene]	000541-73-1	9.00E-02[c]		D[d]	7000
Dichlorobenzene, 1,4- [p-Dichlorobenzene]	000106-46-7	1.00E-01[c]	2.40E-02[b]	C[b]	7800
Dichlorobenzidine, 3,3'-	000091-94-1		4.50E-01[a]	B2[a]	57
Dichlorodifluoromethane	000075-71-8	2.00E-01[a]		D[c]	16000
Dichlorodiphenyldichloroethane, p,p'- [DDD]	000072-54-8		2.40E-01[a]	B2[a]	89
Dichlorodiphenyldichloroethylene, p,p'- [DDE]	000072-55-9		3.40E-01[a]	B2[a]	63
Dichlorodiphenyltrichloroethane, p,p'- [DDT]	000050-29-3	5.00E-04[a]	3.40E-01[a]	B2[a]	62
Dichloroethane, 1,1-	000075-34-3	1.00E-01[b]		C[c]	7800
Dichloroethane, 1,2-	000107-06-2		9.10E-02[a]	B2[a]	73
Dichloroethylene, 1,1-	000075-35-4	9.00E-03[a]	6.00E-01[a]	C[a]	700
Dichloroethylene, 1,2-cis-	000156-59-2	1.00E-02[b]		D[d]	780
Dichloroethylene, 1,2-trans-	000156-60-5	2.00E-02[a]		D[c]	1600
Dichlorophenol, 2,4-	000120-83-2	3.00E-03[a]		D[c]	230
Dichlorophenoxy Acetic Acid, 2,4- [2,4-D]	000094-75-7	1.00E-02[a]		D[c]	780
Dichlorophenoxy)butyric Acid, 4-(2,4- [2,4-DB]	000094-82-6	8.00E-03[a]		D[d]	630
Dichloropropane, 1,2-	000078-87-5		6.80E-02[b]	B2[b]	34
Dichloropropene, 1,3-	000542-75-6	3.00E-04[a]	1.80E-01[b]	B2[a]	12
Dieldrin	000060-57-1	5.00E-05[a]	1.60E+01[a]	B2[a]	0.13
Diethyl Phthalate	000084-66-2	8.00E-01[a]		D[a]	63000
Diisopropyl Methylphosphonate	001445-75-6	8.00E-02[a]		D[a]	6500

NOTE: Soil standards are based on incidental ingestion of soil and dust only. Compliance with soil standards does not guarantee compliance with standards in other media (e.g., groundwater) that may be affected by contaminants in soil. Use of site-specific soil standards must be supported by appropriate institutional controls, i.e., land-use restrictions.

Table 2. Standards for Soil, Iowa Land Recycling Program
(Current as of October 4, 1999)

Chemical	CASRN	Oral Chronic RfD (mg/kg-day)	Oral Slope Factor $(mg/kg\text{-}day)^{-1}$	Cancer Group	Statewide Standard for Soil (mg/kg)
Dimethrin	000070-38-2	3.00E-01[c]		D[c]	23,000
Dimethyl methylphosphonate	000756-79-6	2.00E-01[c]		C[c]	16,000
Dimethylphenol, 2,4-	000105-67-9	2.00E-02[a]		D[d]	1,600
Dinitrobenzene, m- [1,3-Dinitrobenzene]	000099-65-0	1.00E-04[a]		D[a]	78
Dinitrophenol, 2,4-	000051-28-5	2.00E-03[a]		D[d]	160
Dinitrotoluene, 2,6/2,4- (mixture) CASRN for 2,6	000606-20-2	1.00E-03[b]	6.80E-01[a]	B2[a]	3.1
Dinoseb	000088-85-7	1.00E-03[a]		D[a]	78
Dioxane, 1,4- [p-Dioxane]	000123-91-1		1.10E-02[a]	B2[a]	190
Diphenamid	000957-51-7	3.00E-02[a]		D[c]	2,400
Diphenylamine	000122-39-4	2.50E-02[a]		D[c]	2,000
Diquat	000085-00-7	2.20E-03[a]		D[c]	170
Disulfoton	000298-04-4	4.00E-05[a]		E[c]	3.1
Dithiane, 1,4-	000505-29-3	1.00E-02[a]		D[a]	780
Diuron	000330-54-1	2.00E-03[a]		D[c]	160
Endosulfan	000115-29-7	6.00E-03[a]		D[d]	470
Endothall	000145-73-3	2.00E-02[a]		D[c]	1,560
Endrin	000072-20-8	3.00E-04[a]		D[a]	23
Epichlorohydrin	000106-89-8	2.00E-03[b]	9.90E-03[a]	B2[a]	320
Ethylbenzene	000100-41-4	1.00E-01[a]		D[a]	7,800
Ethylene Glycol	000107-21-1	2.00E+00[a]		D[c]	160,000
Ethylene Thiourea	000096-45-7	8.00E-05[a]	1.10E-01[b]	B2[b]	110
Fenamiphos	022224-92-6	2.50E-04[a]		D[c]	20
Fluometuron	002164-17-2	1.30E-02[a]		D[c]	1,000
Fluoranthene	000206-44-0	4.00E-02[a]		D[a]	3100
Fluorene	000086-73-7	4.00E-02[a]		D[a]	3,100
Fluorine (Soluble Fluoride)	007782-41-4	6.00E-02[a]		D[d]	4,700

NOTE: Soil standards are based on incidental ingestion of soil and dust only. Compliance with soil standards does not guarantee compliance with standards in other media (e.g., groundwater) that may be affected by contaminants in soil. Use of site-specific soil standards must be supported by appropriate institutional controls, i.e., land-use restrictions.

Table 2. Standards for Soil, Iowa Land Recycling Program

(Current as of October 4, 1999)

Chemical	CASRN	Oral Chronic RfD (mg/kg-day)	Oral Slope Factor $(mg/kg\text{-}day)^{-1}$	Cancer Group	State-wide Standard for Soil (mg/kg)
Fonofos	000944-22-9	2.00E-03[a]		D[c]	760
Glyphosate	001071-83-6	1.00E-01[a]		D[a]	7800
Heptachlor	000076-44-8	5.00E-04[a]	4.50E+00[a]	B2[a]	0.47
Heptachlor Epoxide	001024-57-3	1.30E-05[a]	9.10E+00[a]	B2[a]	0.23
Hexachlorobenzene	000118-74-1	8.00E-04[a]	1.6E+00[a]	B2[a]	1.63
Hexachlorobutadiene	000087-68-3	2.00E-04[b]	7.80E-02[a]	C[a]	16
Hexachlorocyclohexane, Alpha-	000319-84-6		6.30E+00[a]	B2[a]	0.034
Hexachlorocyclohexane, Gamma- [Lindane]	000058-89-9	3.00E-04[a]	1.30E+00[b]	B2[b]	1.6
Hexachlorocyclopentadiene	000077-47-4	7.00E-03[a]		D[a]	550
Hexachloroethane	000067-72-1	1.00E-03[a]	1.40E-02[a]	C[a]	78
Hexane, N-	000110-54-3	6.00E-02[b]		D[c]	4700
Hexazinone	051235-04-2	3.30E-02[a]		D[c]	2600
HMX	002691-41-0	5.00E-02[a]		D[a]	39000
Imazaquin	081335-37-7	2.50E-01[a]		D[d]	200000
Indeno[1,2,3-cd]pyrene	000193-39-5		7.30E-01[a]	B2[a]	249
Isophorone	000078-59-1	2.00E-01[a]	9.50E-04[a]	C[a]	16000
Isopropyl methylphosphonate	005514-35-2	1.00E-01[c]		D[c]	7800
Kerb [Pronamide]	023950-58-5	7.50E-02[a]		C[c]	5900
Lactofen	077501-63-4	2.00E-03[a]		D[a]	160
Lead	007439-92-1			B2[a]	400
Malathion	000121-75-5	2.00E-02[a]		D[c]	1600
Maleic Hydrazide	000123-33-1	5.00E-01[a]		D[c]	39000
Manganese	007439-96-5	1.40E-01[a]		D[a]	11000
Mercury (elemental)	007439-97-6	3.00E-04[c]		D[a]	23
Methomyl	016752-77-5	2.50E-02[a]		D[c]	2000
Methoxychlor	000072-43-5	5.00E-03[a]		D[a]	390

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Table 2. Standards for Soil, Iowa Land Recycling Program

(Current as of October 4, 1999)

Chemical	CASRN	Oral Chronic RfD (mg/kg-day)	Oral Slope Factor $(mg/kg\text{-}day)^{-1}$	Cancer Group	Statewide Standard for Soil (mg/kg)
Methyl-4-chlorophenoxyacetic acid,2- [MCPA]	000094-74-6	5.00E-04[a]		E[c]	39
Methylene Chloride [Dichloromethane]	000075-09-2	6.00E-02[a]	7.50E-03[a]	B2[a]	280
Methyl Ethyl Ketone [2-Butanone]	000078-93-3	6.00E-01[a]		D[a]	47000
Methyl Isobutyl Ketone	000108-10-1	8.00E-02[b]		D[d]	3300
Methyl Parathion	000298-00-0	2.50E-04[a]		D[c]	0
Methylphenol, 2 [o-Cresol]	000095-48-7	5.00E-02[a]		C[a]	3100
Methylphenol, 4 [p-Cresol]	000106-44-5	5.00E-03[b]		C[a]	390
Methyl tert-Butyl Ether [MTBE]	001634-04-4	3.00E-02[c]		C[c]	2300
Metolachlor	051218-45-2	1.50E-01[a]		C[a]	12000
Metribuzin	021087-64-9	2.50E-02[a]		D[a]	2000
Molybdenum	007439-98-7	5.00E-03[a]		D[c]	390
Monochloramine (measured as free chlorine)	010599-90-3	1.00E-01[a]		D[a]	7800
Naphthalene	000091-20-3	2.00E-02[a]		C[a]	1600
Nickel (soluble salts)	007440-02-0	2.00E-02[a]		D[c]	1600
Nitrate (measured as Nitrogen)	014797-55-8	1.60E+00[a]		D[d]	130000
Nitrite (measured as Nitrogen)	014797-65-0	1.00E-01[a]		D[d]	7800
Nitrobenzene	000098-95-3	5.00E-04[a]		D[a]	39
Nitroguanidine	000556-88-7	1.00E-01[a]		D[a]	7800
Nitrophenol, p-	000100-02-7	8.00E-03[c]		D[c]	630
Nitroso-di-N-butylamine, N-	000924-16-3		5.40E+00[a]	B2[a]	069
Nitrosodiphenylamine, N-	000086-30-6		4.90E-03[a]	B2[a]	280
Octyl Phthalate, di-N-	000117-84-0	2.00E-02[b]		D[d]	16000
Oxamyl	023135-22-0	2.50E-02[a]		E[c]	2000
Paraquat	001910-42-5	4.50E-03[a]		C[a]	350
Pendimethalin	040487-42-1	4.00E-02[a]		D[d]	13000
Pentachlorophenol	000087-86-5	3.00E-02[a]	1.20E-01[a]	B2[a]	3

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Table 2. Standards for Soil, Iowa Land Recycling Program

(Current as of October 4, 1999)

Chemical	CASRN	Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (mg/kg-day)$^{-1}$	Cancer Group	Statewide Standard for Soil (mg/kg)
Permethrin	052645-53-1	5.00E-02[a]		D[d]	4900
Phenmedipham	013684-63-4	2.50E-01[a]		D[d]	20000
Phenol	000108-95-2	6.00E-01[a]		D[d]	47000
Phorate	000298-02-2	2.00E-04[b]		D[d]	16
Picloram	001918-02-1	7.00E-02[a]		D[c]	5500
Polychlorinated Biphenyls [PCBs]	001336-36-3		1.00E+00[a,f]	B2[a]	2
Prometon	001610-18-0	1.50E-02[a]		D[c]	1200
Propachlor	001918-16-7	1.30E-02[a]		D[c]	1000
Propazine	000139-40-2	2.00E-02[a]		C[c]	1600
Propham	000122-42-9	2.00E-02[a]		D[c]	1600
Pursuit	081335-77-5	2.50E-01[a]		D[d]	20000
Pyrene	000129-00-0	3.00E-02[a]		D[d]	2300
RDX [Cyclotrimethylenenitramine]	000121-82-4	3.00E-03[a]	1.10E-01[a]	C[a]	230
Selenium	007782-49-2	5.00E-03[a]		D[c]	390
Sethoxydim	074051-80-2	9.00E-02[a]		D[d]	7000
Silver	007440-22-4	5.00E-03[a]		D[d]	390
Silver Cyanide	000506-64-9	1.00E-01[a]		D[d]	7800
Simazine	000122-34-9	5.00E-03[a]	1.20E-01[b]	C[b]	390
Strontium	007440-24-6	6.00E-01[a]		D[c]	47000
Styrene	000100-42-5	2.00E-01[a]		C[c]	16000
TCDD, 2,3,7,8- [Dioxin]	001746-01-6		1.50E+05[b]	B2[b]	1.40E-05
Tebuthiuron	034014-18-1	7.00E-02[a]		D[c]	5500
Terbacil	005902-51-2	1.30E-02[a]		E[c]	1000
Terbufos	013071-79-9	2.50E-05[b]		D[c]	2
Tetrachlorobenzene, 1,2,4,5-	000095-94-3	3.00E-04[a]		D[d]	23
Tetrachloroethane, 1,1,1,2-	000630-20-6	3.00E-02[a]	2.60E-02[a]	C[a]	2300

NOTE: Soil standards are based on incidental ingestion of soil and dust only. Compliance with soil standards does not guarantee compliance with standards in other media (e.g., groundwater) that may be affected by contaminants in soil. Use of site-specific soil standards must be supported by appropriate institutional controls, i.e., land-use restrictions.

Table 2. Standards for Soil, Iowa Land Recycling Program

(Current as of October 4, 1999)

Chemical	CASRN	Oral Chronic RfD (mg/kg-day)	Oral Slope Factor $(mg/kg\text{-}day)^{-1}$	Cancer Group	Statewide Standard for Soil (mg/kg)
Tetrachloroethylene [PCE]	000127-18-4	1.00E-02[a]		D[d]	780
Thallium	007440-28-0	7.00E-05[c]		D[d]	5.5
Toluene	000108-88-3	2.00E-01[a]		D[d]	16,000
Toxaphene	008001-35-2	1.00E-01[c]	1.10E+00[a]	B2[a]	1.9
Trichloro-1,2,2-trifluoroethane, 1,1,2-	000076-13-1	3.00E+01[a]		D[d]	NL
Trichloroacetic acid	000076-03-9	1.00E-01[c]		C[a]	7,800
Trichlorobenzene, 1,2,4-	000120-82-1	1.00E-02[a]		D[a]	780
Trichlorobenzene, 1,3,5-	000108-70-3	6.00E-03[c]		D[c]	470
Trichloroethane, 1,1,1-	000071-55-6	3.50E-02[c]		D[d]	2,700
Trichloroethane, 1,1,2-	000079-00-5	4.00E-03[a]	5.70E-02[a]	C[a]	310
Trichloroethylene [TCE]	000079-01-6		1.20E-02[c 8)]	B2[c]	180
Trichlorofluoromethane [Fluorotrichloromethane]	000075-69-4	3.00E-01[a]		D[c]	24,000
Trichlorophenol, 2,4,5-	000095-95-4	1.00E-01[a]		D[d]	7,800
Trichlorophenol, 2,4,6-	000088-06-2		1.10E-02[a]	B2[a]	190
Trichlorophenoxy) Propionic Acid, 2(2,4,5-	000093-72-1	8.00E-03[a]		D[a]	630
Trichlorophenoxyacetic Acid, 2,4,5- [2,4,5-T]	000093-76-5	1.00E-02[a]		D[c]	780
Trichloropropane, 1,2,3-	000096-18-4	6.00E-03[a]	7.00E+00[b]	B2[b]	0.3
Trifluralin	001582-09-8	7.50E-03[a]	7.70E-03[a]	C[a]	590
Trinitrotoluene, 2,4,6- [TNT]	000118-96-7	5.00E-04[a]	3.00E-02[a]	C[a]	39
Vanadium	007440-62-2	7.00E-03[b]		D[c]	550
Vinyl Chloride	000075-01-4		1.90E+00[b]	A[b]	1.1
White Phosphorus	007723-14-0	2.00E-05[a]		D[a]	1.6
Xylene (mixture)	001330-20-7	2.00E+00[a]		D[a]	160,000
Zinc (and compounds)	007440-66-6	3.00E-01[a]		D[a]	23,000
Zinc chloride (measured as zinc)	007646-85-7	3.10E-01[c]		D[c]	24,000

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Table 2. Standards for Soil, Iowa Land Recycling Program

(Current as of October 4, 1999)

SOURCES OF INFORMATION:

a - the U.S. Environmental Protection Agency's (EPA's) Integrated Risk Information System (IRIS), Internet: www.epa.gov/iris/ Current as of October 4, 1999.
b - EPA's Health Effects Assessment Summary Tables (HEAST), 9200.6-303 (97-1), EPA-540-R-97-036, PB97-921199, July 1997.
c - EPA Office of Water's Drinking Water Regulations and Health Advisories, EPA 822-B-96-002, October 1996, Internet: www.epa.gov/OST/Tools/dwstds.html
d - represents a default cancer group D classification for chemicals that do not otherwise have a cancer group classification provided in sources a, b, or c.
e - Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons, EPA Office of Water, EPA/600-R-93/089, July 1993.

NOTES:

NL - No Limit [synonyms or acronyms shown in brackets]

1) Chemicals at these concentrations may be at or below background levels. The department may be contacted to determine the need for determining a background standard pursuant to IAC 567-137.4 (455H).

2) Since neither IRIS nor HEAST provide an oral slope factor for beryllium, an oral slope factor has been back-calculated using the 10^{-4} cancer risk given in Source "c" for drinking water.

3) Neither IRIS nor HEAST provide an oral slope factor for cadmium. The drinking water standard for cadmium was based on a cancer group "D" classification. Therefore, soil standards have been based on non-cancer risk using the RfD from IRIS.

4) Chromium VI is classified in IRIS as cancer group "A" by inhalation and "D" by oral exposure. Therefore, cancer group "D" is appropriate for soil standards which are based on ingestion of soil.

5) IRIS does not provide an RfD for copper, but HEAST gives the drinking water action level of 1.3 mg/l. An RfD for copper has been back-calculated for copper using this action level and standard drinking water exposure assumptions.

6) The Lead standards were specified by rule.

7) IRIS provides several tiers of slope factors for PCBs. The central-estimate of the high risk and persistence category has been chosen for establishing soil standards, consistent with the recommended use for sediment or soil ingestion.

8) The cancer group classification and oral slope factor for TCE have been withdrawn from IRIS and HEAST. Source "c" has TCE as a B2 cancer group. A slope factor has been back-calculated using the 10^{-4} cancer risk for drinking water in source "c".

9) PCB's in soil are regulated by EPA under the Toxic Substances Control Act (TSCA).

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Table 1. Standards for Groundwater, Iowa Land Recycling Program
(Current as of October 4, 1999)

Chemical	CASRN	Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (mg/kg-day)$^{-1}$	Cancer Group	Drinking Water Max. Contam. Level (MCL)[f] (mg/l)	Lifetime Health Advisory Level (HAL)[e] (mg/l)	Statewide Standard Protected Groundwater (mg/l)	Statewide Std. Non-Protected Groundwater (mg/l)
Acenaphthene	000083-32-9	6.00E-02[a]		D[d]			0.42	2.1
Acetochlor	034256-82-1	2.00E-02[a]		D[d]			0.14	0.7
Acetone	000067-64-1	1.00E-01[a]		D[d]			0.7	3.5
Acrylamide	000079-06-1	2.00E-04[a]	4.50E+00[a]	B2[a]			0.000039	0.00078
Acrylonitrile	000107-13-1	1.00E-03[b]	5.40E-01[a]	B1[a]			0.00032	0.0065
Alachlor	015972-60-8	1.00E-02[a]	8.00E-02[b]	B2[b]	0.002		0.002	0.044
Aldicarb	000116-06-3	1.00E-03[a]		D[a]		0.007	0.007	0.035
Aldicarb Sulfone	001646-88-4	1.00E-03[a]		D[c]		0.007	0.007	0.035
Aldicarb Sulfoxide	001646-87-3	1.00E-03[c]		D[c]		0.007	0.007	0.035
Aldrin	000309-00-2	3.00E-05[a]	1.70E+01[a]	B2[a]			0.000001	0.00021
Ametryn	000834-12-8	9.00E-03[a]		D[c]		0.06	0.06	0.32
Ammonia	007664-41-7			D[c]		30	30	150
Ammonium Sulfamate	007773-06-0	2.00E-01[a]		D[c]		2	2	10
Anthracene	000120-12-7	3.00E-01[a]		D[a]			2.1	11
Antimony	007440-36-0	4.00E-04[a]		D[c]	0.006	0.003	0.006	0.03
Arsenic, Inorganic	007440-38-2	3.00E-04[a]	1.50E+00[a]	A[a]	0.05		0.05	0.1[n]
Atrazine	001912-24-9	3.50E-02[a]	2.22E-01[b]	C[b]	0.003	0.003	0.003	1.2
Barium (and compunds)	007440-39-3	7.00E-02[a]		D[a]	2	2	2	10
Baygon	000114-26-1	4.00E-03[a]		C[c]		0.003	0.003	0.15
Bentazon	025057-89-0	3.00E-02[a]		E[a]		0.2	0.2	1.1
Benz[a]anthracene	000056-55-3		7.30E-01[a]	B2[a]			0.00024	0.0048
Benzene	000071-43-2		2.90E-02[a]	A[a]	0.005		0.005	0.12
Benzo[a]pyrene	000050-32-8		7.30E+00[a]	B2[a]	0.0002		0.0002	0.004
Benzo[b]fluoranthene	000205-99-2		7.30E-01[c]	B2[a]			0.00024	0.0048

NOTE: Statewide standards for protected groundwater are generally applicable for use as screening and reporting levels. Statewide standards for non-protected groundwater are generally applicable to water in formations with a hydraulic conductivity of less than 0.44 m/day.

Table 1. Standards for Groundwater, Iowa Land Recycling Program
(Current as of October 4, 1999)

Chemical	CASRN	Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (mg/kg-day)$^{-1}$	Cancer Group	Drinking Water Max. Contam. Level (MCL)[f] (mg/l)	Lifetime Health Advisory Level (HAL)[e] (mg/l)	Statewide Standard Protected Groundwater (mg/l)	Statewide Std. Non-Protected Groundwater (mg/l)
Benzo[k]fluoranthene	000207-08-9		7.30E-02[c]	B2[a]			0.0024	0.048
Beryllium	007440-41-7	2.00E-03[a]		B1[a]	0.004		0.004	0.08
Bis(2-chloroethyl)ether	000111-44-4		1.10E+00[a]	B2[a]			0.000016	0.0032
Bis(2-chloroisopropyl)ether	000108-60-1	4.00E-02[a]		D[e]		0.3	0.03	1.5
Bis(2-ethylhexyl)phthalate	000117-81-7	2.00E-02[a]	1.40E-02[a]	B2[a]	0.006		0.006	0.25
Boron And Borates Only	007440-42-8	9.00E-02[a]		D[e]		0.6	0.06	3.2
Bromacil	000314-40-9	1.30E-01[c]		C[c]		0.09	0.09	4.6
Bromochloromethane	000074-97-5	1.30E-02[c]		D[a]		0.01	0.01	0.46
Bromodichloromethane	000075-27-4	2.00E-02[a]	6.20E-02[a]	B2[a]	0.1[f]		0.016	2[f]
Bromoform	000075-25-2	2.00E-02[a]	7.90E-03[a]	B2[a]	0.1[f]		0.14	2[f]
Bromomethane	000074-83-9	1.40E-03[a]		D[a]		0.01	0.01	0.05
Bromoxynil	001689-84-5	2.00E-02[a]		D[d]			0.14	0.7
Butyl Benzyl Phthlate	000085-68-7	2.00E-01[a]		C[a]			0.14	7
Butylate	002008-41-5	5.00E-02[a]		D[e]		0.35	0.35	1.8
Cadmium	007440-43-9	5.00E-04[a]		B1[a]	0.005	0.005	0.005	0.1
Carbaryl	000063-25-2	1.00E-01[a]		D[e]		0.7	07	3.5
Carbazole	000086-74-8		2.00E-02[h]	B2[h]			0.0088	0.18
Carbofuran	001563-66-2	5.00E-03[a]		E[c]	0.04	0.04	0.04	0.2
Carbon Disulfide	000075-15-0	1.00E-01[a]		D[d]			07	3.5
Carbon Tetrachloride	000056-23-5	7.00E-04[a]	1.30E-01[a]	B2[a]	0.005		0.005	0.1
Carboxin	005234-68-4	1.00E-01[a]		D[e]		0.7	07	3.5
Chloral Hydrate	000302-17-0	2.00E-04[c]		C[c]		0.06	0.06	3
Chloramben	000133-90-4	1.50E-02[a]		D[e]		0.1	0.01	0.53

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Table 1. Standards for Groundwater, Iowa Land Recycling Program
(Current as of October 4, 1999)

Chemical	CASRN	Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (mg/kg-day)$^{-1}$	Cancer Group	Drinking Water Max. Contam. Level (MCL)[f] (mg/l)	Lifetime Health Advisory Level (HAL)[g] (mg/l)	Statewide Standard Protected Groundwater (mg/l)	Statewide Std. Non-Protected Groundwater (mg/l)
Chlordane (also CASRN 12789-03-6)	000057-74-9	5.00E-04[a]	3.50E-01[a]	B2[a]	0.002		0.002	0.04
Chlorimuron, Ethyl-	090982-32-4	2.00E-02[a]		D[d]			0.14	0.7
Chlorine	007782-50-5	1.00E-01[a]		D[c]			0.7	3.5
Chlorine Cyanide	000506-77-4	5.00E-02[a]		D[d]			0.35	1.8
Chlorine Dioxide	010049-04-4	1.00E-02[c]		D[a]		0.3	0.3	1.5
Chlorite (sodium salt)	007758-19-2	3.00E-03[c]		D[a]		0.08	0.08	0.4
Chloroaniline, p-	000106-47-8	4.00E-03[a]		D[d]			0.028	0.14
Chlorobenzene [Monochlorobenzene]	000108-90-7	2.00E-02[a]		D[a]	0.1	0.1	0.1	0.7
Chlorodibromoethane [Dibromochloroethane]	073506-94-2	2.00E-02[c]		C[c]	0.1[t]	0.06	0.1[t]	2[t]
Chloroform	000067-66-3	1.00E-02[a]	6.10E-03[a]	B2[a]	0.1[t]		0.1[t]	2[t]
Chloromethane	000074-87-3	4.00E-03[c]	1.30E-02[b]	C[b]		0.003	0.003	0.15
Chloronaphthalene, Beta-	000091-58-7	8.00E-02[a]		D[d]			0.56	2.8
Chlorophenol, 2-	000095-57-8	5.00E-03[a]		D[c]		0.04	0.04	0.2
Chlorothalonil	001897-45-6	1.50E-02[a]	1.10E-02[b]	B2[b]			0.016	0.32
Chlorotoluene, o- [2-Chlorotoluene]	000095-49-8	2.00E-02[a]		D[c]		0.1	0.1	0.7
Chlorotoluene, p- [4-Chlorotoluene]	000106-43-4	2.00E-02[c]		D[c]		0.1	0.1	0.7
Chlorpyrifos	002921-88-2	3.00E-03[a]		D[c]		0.02	0.02	0.11
Chromium III	016065-83-1	1.50E+00[a]		D[a]	0.1[t]	0.1[t]	0.1	0.5[t]
Chromium VI	018540-29-9	3.00E-03[a]		D[a 2)]	0.1[t]	0.1[t]	0.1	0.5[t]
Chrysene	000218-01-9		7.30E-03[c]	B2[a]			0.024	0.48
Copper	007440-50-8			D[a]	1.3[AL]		1.3	6.5
Cumene [Isopropylbenzene]	000098-82-8	1.00E-01[a]		D[a]			0.7	3.5
Cyanazine	021725-46-2	2.00E-03[b]	8.40E-01[b]	C[b]		0.001	0.001	0.07

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Table 1. Standards for Groundwater, Iowa Land Recycling Program
(Current as of October 4, 1999)

Chemical	CASRN	Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (mg/kg-day)$^{-1}$	Cancer Group	Drinking Water Max. Contam. Level (MCL)[f] (mg/l)	Lifetime Health Advisory Level (HAL)[g] (mg/l)	Statewide Std. Protected Ground-water (mg/l)	Statewide Std. Non-Protected Ground-water (mg/l)
Cyanide [CN^-]	000057-12-5	2.00E-02[a]		D[a]	0.2	0.2	0.02	1
Dactlial	001861-32-1	1.00E-02[a]		D[c]			0.007	0.35
Dalapon, sodium salt	000075-99-0	3.00E-02[a]		D[c]	0.2	0.2	0.02	1.1
Di(2-ethylhexyl)adipate	000103-23-1	6.00E-01[a]	1.20E-03[a]	C[a]	0.4	0.4	0.4	21
Diazinon	000333-41-5	9.00E-04[h]		E[c]		0.0006	0.0006	0.032
Dibenz[a,h]anthracene	000053-70-3		7.30E+00[c]	B2[a]			0.0000024	0.00048
Dibromoacetonitrile	003252-43-5	2.00E-02[c]		C[c]		0.02	0.02	1
Dibromochloromethane	000124-48-1	2.00E-02[a]	8.40E-02[a]	C[a]			0.004	0.7
Dibromo-3-chloropropane, 1,2- [DBCP]	000096-12-8		1.4E+00[b]	B2[b]	0.0002		0.0002	0.004
Dibromoethane, 1,2- [Ethylene Dibromide]	000106-93-4		8.50E+01[a]	B2[a]	0.00005		0.00005	0.001
Dibromomethane [Methylene Bromide]	000074-95-3	1.00E-02[b]		D[d]			0.007	0.35
Dibutyl Phthalate	000084-74-2	1.00E-01[a]		D[a]			0.07	3.5
Dicamba	001918-00-9	3.00E-02[c]		D[c]		0.2	0.2	1.1
Dichloroacetonitrile	003018-12-0	8.00E-03[c]		C[c]		0.006	0.0006	0.3
Dichlorobenzene, 1,2- [o-Dichlorobenzene]	000095-50-1	9.00E-02[a]		D[a]	0.6	0.6	0.06	3.2
Dichlorobenzene, 1,3- [m-Dichlorobenzene]	000541-73-1	9.00E-02[c]		D[a]		0.6	0.6	3.2
Dichlorobenzene, 1,4- [p-Dichlorobenzene]	000106-46-7	1.00E-01[c]	2.40E-02[b]	C[b]	0.075	0.075	0.0075	3.8
Dichlorobenzidine, 3,3'-	000091-94-1		4.50E-01[a]	B2[a]			0.00039	0.0078
Dichlorodifluoromethane	000075-71-8	2.00E-01[a]		D[c]		1	0.1	7
Dichlorodiphenyldichloroethane, p,p'- [DDD]	000072-54-8		2.40E-01[a]	B2[a]			0.00072	0.015
Dichlorodiphenyldichloroethylene, p,p'- [DDE]	000072-55-9		3.40E-01[a]	B2[a]			0.00050	0.01
Dichlorodiphenyltrichloroethane, p,p'- [DDT]	000050-29-3	5.00E-04[a]	3.40E-01[a]	B2[a]			0.00051	0.01
Dichloroethane, 1,1-	000075-34-3	1.00E-01[b]		C[a]			0.07	3.5

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Table 1. Standards for Groundwater, Iowa Land Recycling Program
(Current as of October 4, 1999)

Chemical	CASRN	Oral Chronic RfD (mg/kg-day)	Oral Slope Factor $(mg/kg\text{-}day)^{-1}$	Cancer Group	Drinking Water Max. Contam. Level (MCL)[f] (mg/l)	Lifetime Health Advisory Level (HAL)[c] (mg/l)	Statewide Standard Protected Groundwater (mg/l)	Statewide Std. Non-Protected Groundwater (mg/l)
Dichloroethane, 1,2-	000107-06-2		9.10E-02[a]	B2[a]	0.005		0.005	0.1
Dichloroethylene, 1,1-	000075-35-4	9.00E-03[a]	6.00E-01[a]	C[a]	0.007	0.007	0.007	0.35
Dichloroethylene, 1,2-cis-	000156-59-2	1.00E-02[b]		D[a]	0.07	0.07	0.07	0.35
Dichloroethylene, 1,2-trans-	000156-60-5	2.00E-02[a]		D[c]	0.1	0.1	0.1	0.7
Dichlorophenol, 2,4-	000120-83-2	3.00E-03[a]		D[c]		0.02	0.02	0.11
Dichlorophenoxy Acetic Acid, 2,4- [2,4-D]	000094-75-7	1.00E-02[a]		D[c]	0.07	0.07	0.07	0.35
Dichlorophenoxy)butyric Acid, 4-(2,4- [2,4-DB]	000094-82-6	8.00E-03[a]		D[d]			0.056	0.28
Dichloropropane, 1,2-	000078-87-5		6.80E-02[b]	B2[b]	0.005		0.005	0.1
Dichloropropene, 1,3-	000542-75-6	3.00E-04[a]	1.80E-01[b]	B2[a]			0.001	0.019
Dieldrin	000060-57-1	5.00E-05[a]	1.60E+01[a]	B2[a]			0.000042	0.00022
Diethyl Phthalate	000084-66-2	8.00E-01[a]		D[a]		5	5	28
Diisopropyl Methylphosphonate	001445-75-6	8.00E-02[a]		D[a]		0.6	0.6	3
Dimethrin	000070-38-2	3.00E-01[c]		D[c]		2	2	11
Dimethyl methylphosphonate	000756-79-6	2.00E-01[c]		C[c]		0.1	0.1	7
Dimethylphenol, 2,4-	000105-67-9	2.00E-02[a]		D[d]			0.14	0.7
Dinitrobenzene, m- [1,3-Dinitrobenzene]	000099-65-0	1.00E-04[a]		D[a]		0.001	0.001	0.005
Dinitrophenol, 2,4-	000051-28-5	2.00E-03[a]		D[d]			0.014	0.07
Dinitrotoluene, 2,6/2,4- (mixture) CASRN for 2,6	000606-20-2	1.00E-03[b]	6.80E-01[a]	B2[a]			0.00026	0.0051
Dinoseb	000088-85-7	1.00E-03[a]		D[a]	0.007	0.007	0.007	0.035
Dioxane, 1,4- [p-Dioxane]	000123-91-1		1.10E-02[a]	B2[a]			0.016	0.32
Diphenamid	000957-51-7	3.00E-02[a]		D[c]		0.2	0.2	1.1
Diphenylamine	000122-39-4	2.50E-02[a]		D[c]		0.2	0.2	1
Diquat	000085-00-7	2.20E-03[a]		D[c]	0.02	0.02	0.02	1

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Table 1. Standards for Groundwater, Iowa Land Recycling Program
(Current as of October 4, 1999)

Chemical	CASRN	Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (mg/kg-day)$^{-1}$	Cancer Group	Drinking Water Max. Contam. Level (MCL)[f] (mg/l)	Lifetime Health Advisory Level (HAL)[g] (mg/l)	Statewide Standard Protected Groundwater (mg/l)	Statewide Std. Non-Protected Groundwater (mg/l)
Disulfoton	000298-04-4	4.00E-05[a]		E[c]		0.0003	0.0003	0.015
Dithiane, 1,4-	000505-29-3	1.00E-02[a]		D[a]		0.08	0.08	0.4
Diuron	000330-54-1	2.00E-03[a]		D[c]		0.01	0.01	0.07
Endosulfan	000115-29-7	6.00E-03[a]		D[d]			0.042	0.21
Endothall	000145-73-3	2.00E-02[a]		D[c]	0.1	0.1	0.1	0.7
Endrin	000072-20-8	3.00E-04[a]		D[a]	0.002	0.002	0.002	0.011
Epichlorohydrin	000106-89-8	2.00E-03[b]	9.90E-03[a]	B2[a]			0.018	0.35
Ethylbenzene	000100-41-4	1.00E-01[a]		D[a]	0.7	0.7	0.7	3.5
Ethylene Glycol	000107-21-1	2.00E+00[a]		D[c]		7	7	70
Ethylene Thiourea	000096-45-7	8.00E-05[a]	1.10E-01[b]	B2[b]			0.0016	0.032
Fenamiphos	022224-92-6	2.50E-04[a]		D[c]		0.002	0.002	0.01
Fluometuron	002164-17-2	1.30E-02[a]		D[c]		0.09	0.09	0.46
Fluoranthene	000206-44-0	4.00E-02[a]		D[a]			0.028	1.4
Fluorene	000086-73-7	4.00E-02[a]		D[a]			0.028	1.4
Fluorine (Soluble Fluoride)	007782-41-4	6.00E-02[a]		D[d]	4		4	20
Fonofos	000944-22-9	2.00E-03[a]		D[c]		0.01	0.01	0.07
Formaldehyde	000050-00-0	2.00E-01[a]		B1[a]		1	1	20
Glyphosate	001071-83-6	1.00E-01[a]		D[a]	0.7	0.7	0.7	3.5
Heptachlor	000076-44-8	5.00E-04[a]	4.50E+00[a]	B2[a]	0.0004		0.0004	0.008
Heptachlor Epoxide	001024-57-3	1.30E-05[a]	9.10E+00[a]	B2[a]	0.0002		0.0002	0.004
Hexachlorobenzene	000118-74-1	8.00E-04[a]	1.6E+00[a]	B2[a]	0.001		0.001	0.02
Hexachlorobutadiene	000087-68-3	2.00E-04[b]	7.80E-02[a]	C[a]		0.001	0.001	0.05
Hexachlorocyclohexane, Alpha-	000319-84-6		6.30E+00[a]	B2[a]			0.000028	0.00056

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Table 1. Standards for Groundwater, Iowa Land Recycling Program
(Current as of October 4, 1999)

Chemical	CASRN	Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (mg/kg-day)$^{-1}$	Cancer Group	Drinking Water Max. Contam. Level (MCL)[f] (mg/l)	Lifetime Health Advisory Level (HAL)[e] (mg/l)	Statewide Standard Protected Groundwater (mg/l)	Statewide Std. Non-Protected Groundwater (mg/l)
Hexachlorocyclohexane, Gamma- [Lindane]	000058-89-9	3.00E-04[a]	1.30E+00[b]	B2[b]	0.0002	0.0002	0.0002	0.004
Hexachlorocyclopentadiene	000077-47-4	7.00E-03[a]		D[a]	0.05		0.05	0.25
Hexachloroethane	000067-72-1	1.00E-03[a]	1.40E-02[a]	C[a]		0.001	0.001	0.05
Hexane, N-	000110-54-3	6.00E-02[b]		D[c]			0.42	2.1
Hexazinone	051235-04-2	3.30E-02[a]		D[c]		0.2	0.2	1.2
HMX	002691-41-0	5.00E-02[a]		D[a]		0.4	0.4	2
Imazaquin	081335-37-7	2.50E-01[a]		D[d]			1.8	8.8
Indeno(1,2,3-cd)pyrene	000193-39-5		7.30E-01[c]	B2[a]			0.00024	0.0048
Isophorone	000078-59-1	2.00E-01[a]	9.50E-04[a]	C[a]		0.1	0.1	7
Isopropyl methylphosphonate	005514-35-2	1.00E-01[c]		D[c]		0.7	0.7	3.5
Kerb [Pronamide]	023950-58-5	7.50E-02[a]		C[c]		0.05	0.05	2.6
Lactofen	077501-63-4	2.00E-03[a]		D[d]			0.014	0.07
Lead And Compounds	007439-92-1			B2[a]	0.015[AL]		0.015	0.3
Malathion	000121-75-5	2.00E-02[a]		D[c]		0.2	0.2	1
Maleic Hydrazide	000123-33-1	5.00E-01[a]		D[c]		4	4	20
Manganese	007439-96-5	1.40E-01[a]		D[a]			0.98	4.9
Mercury (elemental)	007439-97-6	3.00E-04[c]		D[a]	0.002	0.002	0.002	0.011
Methomyl	016752-77-5	2.50E-02[a]		D[c]		0.2	0.2	1
Methoxychlor	000072-43-5	5.00E-03[a]		D[a]	0.04	0.04	0.04	0.2
Methyl-4-chlorophenoxyacetic acid, 2- [MCPA]	000094-74-6	5.00E-04[a]		E[c]		0.01	0.01	0.05
Methylene Chloride [Dichloromethane]	000075-09-2	6.00E-02[a]	7.50E-03[a]	B2[a]	0.005		0.005	0.47
Methyl Ethyl Ketone	000078-93-3	6.00E-01[a]		D[a]			4.2	21
Methyl Isobutyl Ketone	000108-10-1	8.00E-02[b]		D[d]			0.56	2.8

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Table 1. Standards for Groundwater, Iowa Land Recycling Program
(Current as of October 4, 1999)

Chemical	CASRN	Oral Chronic RfD (mg/kg-day)	Oral Slope Factor $(mg/kg\text{-}day)^{-1}$	Cancer Group	Drinking Water Max. Contam. Level (MCL)[f] (mg/l)	Lifetime Health Advisory Level (HAL)[g] (mg/l)	Statewide Std. Protected Ground-water (mg/l)	Statewide Std. Non-Protected Ground-water (mg/l)
Methyl Parathion	000298-00-0	2.50E-04[a]		D[c]		0.002	0002	0.01
Methylphenol, 2 [o-Cresol]	000095-48-7	5.00E-02[a]		C[a]			0035	1.8
Methylphenol, 4 [p-Cresol]	000106-44-5	5.00E-03[b]		C[a]			00035	0.18
Methyl tert-Butyl Ether [MTBE]	001634-04-4	3.00E-02[c]		C[c]		0.02	002	1.1
Metolachlor	051218-45-2	1.50E-01[a]		C[a]		0.07	007	5.3
Metribuzin	021087-64-9	2.50E-02[a]		D[a]		0.1	01	0.88
Molybdenum	007439-98-7	5.00E-03[a]		D[c]		0.04	004	0.2
Monochloramine (measured as free chlorine)	010599-90-3	1.00E-01[a]		D[a]		4	4	20
Naphthalene	000091-20-3	2.00E-02[a]		C[a]		0.02	002	0.7
Nickel (soluble salts)	007440-02-0	2.00E-02[a]		D[c]		0.1	01	0.7
Nitrate (measured as Nitrogen)	014797-55-8	1.60E+00[a]		D[d]	10		10	56
Nitrite (measured as Nitrogen)	014797-65-0	1.00E-01[a]		D[d]	1		1	5
Nitrobenzene	000098-95-3	5.00E-04[a]		D[a]			00035	0.018
Nitroguanidine	000556-88-7	1.00E-01[a]		D[a]		0.7	07	3.5
Nitrophenol, p-	000100-02-7	8.00E-03[c]		D[c]		0.06	006	0.3
Nitroso-di-N-butylamine, N-	000924-16-3		5.40E+00[a]	B2[a]			0.000032	0.00065
Nitrosodiphenylamine, N-	000086-30-6		4.90E-03[a]	B2[a]			0035	0.71
Octyl Phthalate, di-N-	000117-84-0	2.00E-02[a]		D[d]			01	0.7
Oxamyl	023135-22-0	2.50E-02[a]		E[c]	0.2	0.2	02	1
Paraquat	001910-42-5	4.50E-03[a]		C[a]		0.03	003	0.16
Pendimethalin	040487-42-1	4.00E-02[a]		D[d]			028	1.4
Pentachlorophenol	000087-86-5	3.00E-02[a]	1.20E-01[a]	B2[a]	0.001		0001	0.03
Permethrin	052645-53-1	5.00E-02[a]		D[d]			053	1.8

NOTE: Statewide standards for protected groundwater are generally applicable for use as screening and reporting levels. Statewide standards for non-protected groundwater are generally applicable to water in formations with a hydraulic conductivity of less than 0.44 m/day.

Table 1. Standards for Groundwater, Iowa Land Recycling Program
(Current as of October 4, 1999)

Chemical	CASRN	Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (mg/kg-day)$^{-1}$	Cancer Group	Drinking Water Max. Contam. Level (MCL)[f] (mg/l)	Lifetime Health Advisory Level (HAL)[c] (mg/l)	Statewide Standard Protected Groundwater (mg/l)	Statewide Std. Non-Protected Groundwater (mg/l)
Phenmedipham	013684-63-4	2.50E-01[a]		D[d]			1.8	8.8
Phenol	000108-95-2	6.00E-01[a]		D[a]		4	4	21
Phorate	000298-02-2	2.00E-04[b]		D[d]			0.0014	0.007
Picloram	001918-02-1	7.00E-02[a]		D[c]	0.5	0.5	0.5	2.5
Polychlorinated Biphenyls [PCBs]	001336-36-3		3.00E-01[a,j]	B2[a]	0.0005		0.0005	0.012
Prometon	001610-18-0	1.50E-02[a]		D[c]		0.1	0.1	0.53
Propachlor	001918-16-7	1.30E-02[a]		D[c]		0.09	0.09	0.46
Propazine	000139-40-2	2.00E-02[a]		C[c]		0.01	0.01	0.7
Propham	000122-42-9	2.00E-02[a]		D[c]		0.1	0.1	0.7
Pursuit	081335-77-5	2.50E-01[a]		D[d]			1.8	8.8
Pyrene	000129-00-0	3.00E-02[a]		D[a]			0.21	1.1
RDX [Cyclotrimethylenenitramine]	000121-82-4	3.00E-03[a]	1.10E-01[a]	C[a]		0.002	0.002	0.11
Selenium	007782-49-2	5.00E-03[a]		D[a]	0.05		0.05	0.25
Sethoxydim	074051-80-2	9.00E-02[a]		D[d]			0.63	3.2
Silver	007440-22-4	5.00E-03[a]		D[a]		0.1	0.1	0.5
Silver Cyanide	000506-64-9	1.00E-01[a]		D[d]			0.7	3.5
Simazine	000122-34-9	5.00E-03[a]	1.20E-01[b]	C[b]	0.004	0.004	0.004	0.2
Strontium	007440-24-6	6.00E-01[a]		D[c]		17	17	85
Styrene	000100-42-5	2.00E-01[a]		C[c]	0.1	0.1	0.1	7
TCDD, 2,3,7,8- [Dioxin]	001746-01-6		1.50E+05[b]	B2[b]	3.00E-08		3.00E-08	6.00E-07
Tebuthiuron	034014-18-1	7.00E-02[a]		D[c]		0.5	0.5	2.5
Terbacil	005902-51-2	1.30E-02[a]		E[c]		0.09	0.09	0.46
Terbufos	013071-79-9	2.50E-05[b]		D[c]		0.0009	0.0009	0.0045

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(Current as of October 4, 1999)

Chemical	CASRN	Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (mg/kg-day)$^{-1}$	Cancer Group	Drinking Water Max. Contam. Level (MCL)[f] (mg/l)	Lifetime Health Advisory Level (HAL)[e] (mg/l)	Statewide Standard Protected Groundwater (mg/l)	Statewide Std. Non-Protected Groundwater (mg/l)
Tetrachlorobenzene, 1,2,4,5-	000095-94-3	3.00E-04[a]		D[d]			0.0021	0.011
Tetrachloroethane, 1,1,1,2-	000630-20-6	3.00E-02[a]	2.60E-02[a]	C[a]		0.07	0.007	3.5
Tetrachloroethylene [PCE]	000127-18-4	1.00E-02[a]		D[d]	0.005		0.005	0.35
Thallium	007440-28-0	7.00E-05[c]		D[d]	0.002	0.0005	0.002	0.01
Toluene	000108-88-3	2.00E-01[a]		D[a]	1	1	1	7
Toxaphene	008001-35-2	1.00E-01[c]	1.10E+00[a]	B2[a]	0.003		0.003	0.06
Trichloro-1,2,2-trifluoroethane, 1,1,2-	000076-13-1	3.00E+01[a]		D[d]			240	1,100
Trichloroacetic acid	000076-03-9	1.00E-01[c]		C[a]		0.3	0.3	15
Trichlorobenzene, 1,2,4-	000120-82-1	1.00E-02[a]		D[a]	0.07	0.07	0.07	0.35
Trichlorobenzene, 1,3,5	000108-70-3	6.00E-03[c]		D[c]		0.04	0.04	0.21
Trichloroethane, 1,1,1-	000071-55-6	3.50E-02[c]		D[a]	0.2	0.2	0.2	1.2
Trichloroethane, 1,1,2-	000079-00-5	4.00E-03[a]	5.70E-02[a]	C[a]	0.005	0.003	0.005	0.25
Trichloroethylene [TCE]	000079-01-6			B2[c]	0.005		0.005	0.1
Trichlorofluoromethane [Fluorotrichloromethane]	000075-69-4	3.00E-01[a]		D[c]		2	2	11
Trichlorophenol, 2,4,5-	000095-95-4	1.00E-01[a]		D[d]			0.7	3.5
Trichlorophenol, 2,4,6-	000088-06-2		1.10E-02[a]	B2[a]			0.016	0.32
Trichlorophenoxy) Propionic Acid, 2(2,4,5-	000093-72-1	8.00E-03[a]		D[a]	0.05	0.05	0.05	0.28
Trichlorophenoxyacetic Acid, 2,4,5- [2,4,5-T]	000093-76-5	1.00E-02[a]		D[c]		0.07	0.07	0.35
Trichloropropane, 1,2,3-	000096-18-4	6.00E-03[a]	7.00E+00[b]	B2[b]		0.04	0.04	0.8
Trifluralin	001582-09-8	7.50E-03[a]	7.70E-03[a]	C[a]		0.005	0.005	0.26
Trinitroglycerol [Nitroglycerin]	000055-63-0			D[d]		0.005	0.005	0.025
Trinitrotoluene, 2,4,6- [TNT]	000118-96-7	5.00E-04[a]	3.00E-02[a]	C[a]		0.002	0.002	0.1
Vanadium	007440-62-2	7.00E-03[b]		D[c]			0.049	0.25

NOTE: Statewide standards for protected groundwater are generally applicable for use as screening and reporting levels. Statewide standards for non-protected groundwater are generally applicable to water in formations with a hydraulic conductivity of less than 0.44 m/day.

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Vinyl Chloride	000075-01-4		1.90E+00[b]	A[b]	0.002		0.002	0.04
White Phosphorus	007723-14-0	2.00E-05[a]		D[d]		0.0001	0.0001	0.0007
Xylene, Mixture	001330-20-7	2.00E+00[a]		D[d]	10	10	10	70
Zinc (and compounds)	007440-66-6	3.00E-01[a]		D[d]		2	2	11
Zinc Chloride (measured as zinc)	007646-85-7	3.10E-01[c]		D[d]		2	2	11

SOURCES OF INFORMATION:

a - the U.S. Environmental Protection Agency's (EPA's) Integrated Risk Information System (IRIS), Internet: http://www.epa.gov/iris/ Current as of October 4, 1999.

b - EPA's Health Effects Summary Tables (HEAST), 9200.6-303 (97-1), EPA-540-R-97-036, PB97-921199, July 1997.

c - EPA's Office of Water, Drinking Water Regulations and Health Advisories, EPA 822-B-96-002, October 1996, Internet: www.epa.gov/OST/Tools/dwstds.html

d - represents a default cancer group D classification for chemicals that do not otherwise have a cancer group classification provided in sources a, b, or c.

e - Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons, EPA Office of Water, EPA/600-R-93/089, July 1993.

f - EPA's Office of Water, Current Drinking Water Standards, Internet: www.epa.gov/OGWDW/wot/appa.html

NOTES:

[synonyms or acronyms shown in brackets]

T - Standards apply to Total Chromium III + Chromium VI or Total Trihalomethanes, i.e., Bromodichloromethane + Bromofrom + Chlorodibromoethane + Chloroform.

AL - Action Level. Assumed to be equivalent to an MCL.

1) The statewide standard for arsenic in a nonprotected groundwater source is specified by rule (Paragraph 137.5(4)b.)
2) Chromium VI is classified in IRIS as cancer group "A" by inhalation and "D" by oral exposure. Therefore, cancer group "D" is appropriate for water ingestion.
3) IRIS provides several tiers of slope factors for PCBs. The central-estimate of the low risk and persistence category has been chosen for establishing groundwater standards, consistent with recommended use for ingestion of water-soluble congeners.

GENERAL NOTE: The standards in this table are based on a procedure for determining standards specified by Rule 567—137.5. The current toxicity data (i.e., oral chronic reference dose and oral slope factor) and prescribed procedure take precedent over any value provided in this table. The department should be contacted for determination of standards for chemicals not listed in this table.

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